

CITY OF KEY WEST

RICHARD A. HEYMAN

ENVIRONMENTAL PROTECTION FACILITY

AERATION SYSTEM UPGRADE AND ELECTRICAL

SWITCHGEAR REPLACEMENT

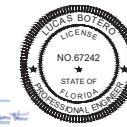
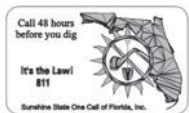
CITY OF KEY WEST PROJECT NO.: SE35042002

CITY OF KEY WEST ITB NO.: 21-006

FEBRUARY 2021



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This seal has been digitally signed and sealed by Linda Bennett on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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Black & Veatch Corporation
 3111 North University Drive, Suite 700
 Coral Springs, FL 33065 Certificate No. 8132



199322
 SHEET
 1 OF 27

GENERAL NOTES

- ALL CONSTRUCTION MATERIALS AND TESTING SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE CITY OF KEY WEST, LOCAL, MONROE COUNTY, STATE OF FLORIDA, AND NATIONAL CODES.
- IF SPECIFICATIONS OR DRAWINGS CONFLICT, CONTRACTOR SHALL NOTIFY THE CITY OF KEY WEST FOR MORE INFORMATION PRIOR TO PROCEEDING WITH THE WORK.
- REVIEW OF THE SHOP DRAWINGS BY THE CITY OF KEY WEST OR AUTHORIZED REPRESENTATIVE IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE SITE FOR INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION, PROCESSES, OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION AND FOR COORDINATION OF THE WORK OF ALL TRADES.
- "SCREENED" (LIGHT) DELINEATION INDICATED ON THE DRAWINGS DENOTES EXISTING FACILITIES. "SCREENED" INFORMATION IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE ORDERING OF MATERIALS AND BEGINNING OF CONSTRUCTION. "BOLD" DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
- EXISTING UTILITIES AND STRUCTURES (UNDERGROUND, SURFACE, OR OVERHEAD) ARE INDICATED ONLY TO THE EXTENT THAT SUCH INFORMATION WAS KNOWN, OR MADE AVAILABLE TO, OR DISCOVERED BY THE ENGINEER IN PREPARING THE DRAWINGS. THE LOCATIONS, CONFIGURATIONS, AND ELEVATIONS OF SUBSURFACE FACILITIES AND UTILITIES ARE APPROXIMATE, AND NOT ALL UTILITIES AND FACILITIES MAY BE INDICATED.

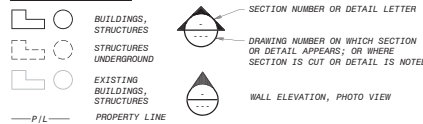
UTILITY NOTES

- CALL BEFORE YOU DIG. CONTRACTOR SHALL VERIFY PRECISE LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STRUCTURES, WHETHER INDICATED ON THE DRAWINGS OR NOT, IN THE FIELD IN ADVANCE OF EXCAVATING. THE CONTRACTOR SHALL CONTACT FLORIDA SUNSHINE ONE TO VERIFY UNDER GROUND UTILITIES WITHIN THE PROJECT SITE. THE FLORIDA SUNSHINE ONE TELEPHONE NUMBER IS 811.
- CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL, DEMOLITION, RECONSTRUCTION, AND RECONNECTION OF EXISTING FACILITIES AS REQUIRED TO COMPLETE THE WORK. IF REQUIRED AFTER FIELD VERIFICATION, CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO DETERMINE ANY NECESSARY MODIFICATIONS TO THE PROPOSED NEW WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF REPAIRING ALL DAMAGED UTILITIES.
- BEFORE CONSTRUCTION IS STARTED, CONTRACTOR SHALL COORDINATE WITH THE OWNER OF EACH UTILITY AND DEFINE THE REQUIREMENTS AND METHODS TO ACCOMMODATE THE PROTECTION, TEMPORARY SUPPORT, ADJUSTMENT, OR RELOCATION OF ANY UTILITIES AFFECTED BY THE PROPOSED NEW WORK.

CIVIL NOTES

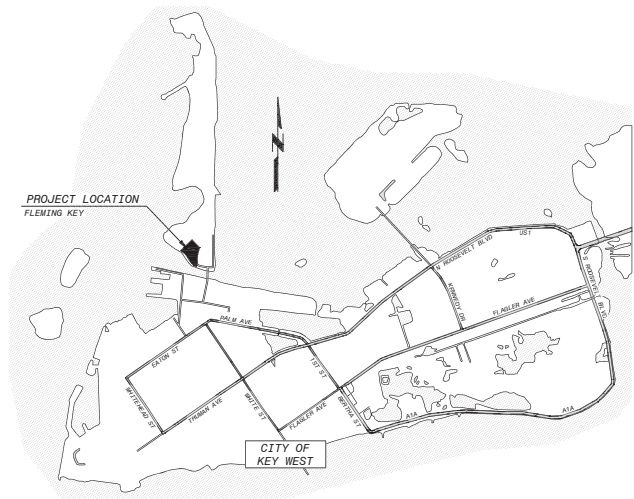
- ALL EXISTING FEATURES TO REMAIN UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- CONTRACTOR SHALL COMPLY WITH THE GOVERNING AGENCY NPDES CONSTRUCTION REQUIREMENTS, AND SHALL PROVIDE APPROPRIATE MITIGATION MEASURES OR PROTECTION AND RESTORATION AT ALL LOCATIONS AS REQUIRED BY THEIR OPERATIONS, AND AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION. CONTRACTOR SHALL MAINTAIN AND REPAIR EROSION AND SEDIMENT CONTROL DEVICES THROUGHOUT THE DURATION OF CONSTRUCTION.
- CLEAR THE SITE USING STANDARD CLEARING AND GRUBBING PROCEDURES.
- SOD ALL DISTURBED AREAS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY CONSTRUCTION DEBRIS TO AN APPROVED FACILITY.
- CONTRACTOR SHALL USE CAUTION WHEN WORKING NEAR OVERHEAD OR UNDER GROUND UTILITIES.
- CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING TREES, SHRUBS, AND PLANTS UNLESS OTHERWISE NOTED.
- FINISHED GRADE ELEVATION AT ANY STRUCTURE, WHERE NOT ADJACENT TO PAVEMENT, SHALL BE APPROXIMATELY 6 INCHES BELOW FINISHED FLOOR ELEVATION UNLESS OTHERWISE NOTED.
- THE CONTRACTOR'S OPERATIONS SHALL CONFORM TO THE RULES AND REGULATIONS OF THE STATE CONSTRUCTION SAFETY ORDERS PERTAINING TO EXCAVATION AND TRENCHING.
- IF ANY SIGNAGE IS DEMOLISHED OR DAMAGED DURING CONSTRUCTION THE CONTRACTOR WILL REPLACE IT IN KIND PER CITY OF KEY WEST SPECIFICATIONS.

GENERAL LEGEND



ABBREVIATIONS

- ABDN ABANDON
- BOT BOTTOM
- CB CATCH BASIN
- CLDIP CEMENT LINED DUCTILE IRON PIPE
- CONC CONCRETE
- CPE CORRUGATED POLYETHYLENE
- DF DRAINAGE FORCE MAIN
- DIA DIAMETER
- DIP DUCTILE IRON PIPE
- DR DRIVE, DIMENSION RATIO
- DRN DRAIN
- E EAST
- EL ELEVATION
- EW EACH WAY
- EX, EXST EXISTING
- FL FLANGE
- FM FORCE MAIN
- HORIZ HORIZONTAL
- JWB JWB
- IP IRON POST
- LT LEFT
- MAX MAXIMUM
- MH MANHOLE
- MIN MINIMUM
- MJ MECHANICAL JOINT
- N NORTH
- NO. NUMBER
- NOT TO SCALE
- OC ON CENTER
- OD OUTSIDE DIAMETER
- PL PROPERTY LINE
- PP POWER POLE
- PVC POLYVINYLCHLORIDE
- RCP REINFORCED CONCRETE PIPE
- REQD REQUIRED
- RJ RESTRAINED JOINT
- RT RIGHT
- R/W RIGHT OF WAY
- S SOUTH, SANITARY
- SDR STORM DRAIN
- SDR STANDARD DIMENSION RATIO
- SPECD SPECIFIED
- SS STORM SEWER
- SS, SST STAINLESS STEEL
- STA STATION
- STW STORMWATER
- T, TEL TELEPHONE
- TYP TYPICAL
- W WEST, WATER
- WT WEIGHT



STRUCTURE, ROOM OR AREA	NFPA 820		FIRE CODE REQUIREMENTS	ELECTRICAL CODE		
	TABLE, ROW, & LINE	FIRE PROTECT MEASURES		CLASS	GROUP	DIVISION
OPERATIONS BUILDING - ELECTRICAL ROOM	TABLE 5.2.2, ROW 27	H				
BLOWERS AREA	N/A	FE				
	UNCLASSIFIED AREA - BEYOND 10 FEET OF THE BASIN WALL					
	CLASSIFIED AREA - WITHIN 10 FEET OF THE BASIN WALL (1)	TABLE 5.2.2, ROW 7C	H			

NOTES:
 (1) INTERIOR OF THE TANK FROM THE MINIMUM OPERATING WATER SURFACE TO THE TOP OF THE TANK WALL; ENVELOPE 0.46 M (18 IN.) ABOVE THE TOP OF THE TANK AND EXTENDING 0.46 M (18 IN.) BEYOND THE EXTERIOR WALL; ENVELOPE 0.46 M (18 IN.) ABOVE GRADE EXTENDING 3 M (10 FT) HORIZONTALLY FROM THE EXTERIOR TANK WALLS

DESIGNED: MLH
 DETAILED: DJW
 CHECKED: MW, LB
 APPROVED:

DATE: FEBRUARY 2021

PROJECT NO. 199322

SHEET 2 OF 27

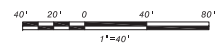
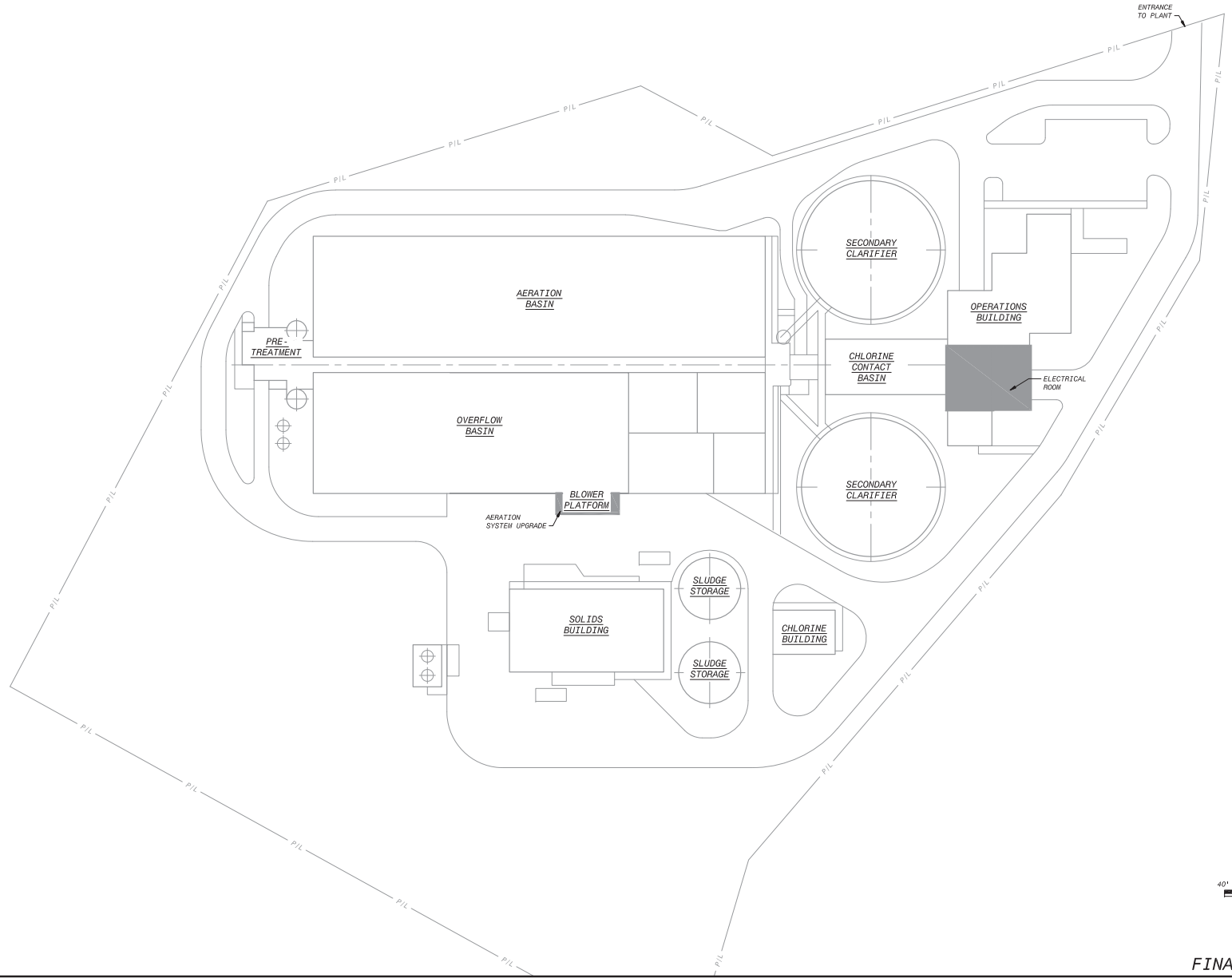
REVISIONS AND RECORDS OF USE: NO. BY DATE

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CITY OF KEY WEST PROTECTION AND ENVIRONMENTAL SERVICES AND ELECTRICAL SWITCHGEAR REPLACEMENT

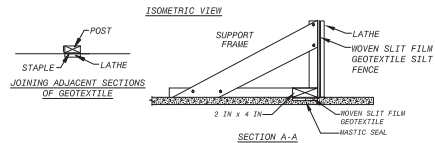
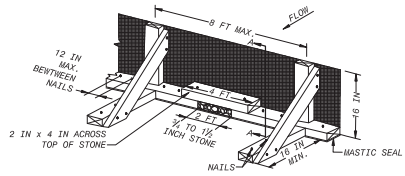
GENERAL LEGENDS, ABBREVIATIONS AND LOCATION MAP

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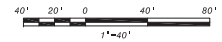
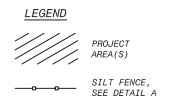
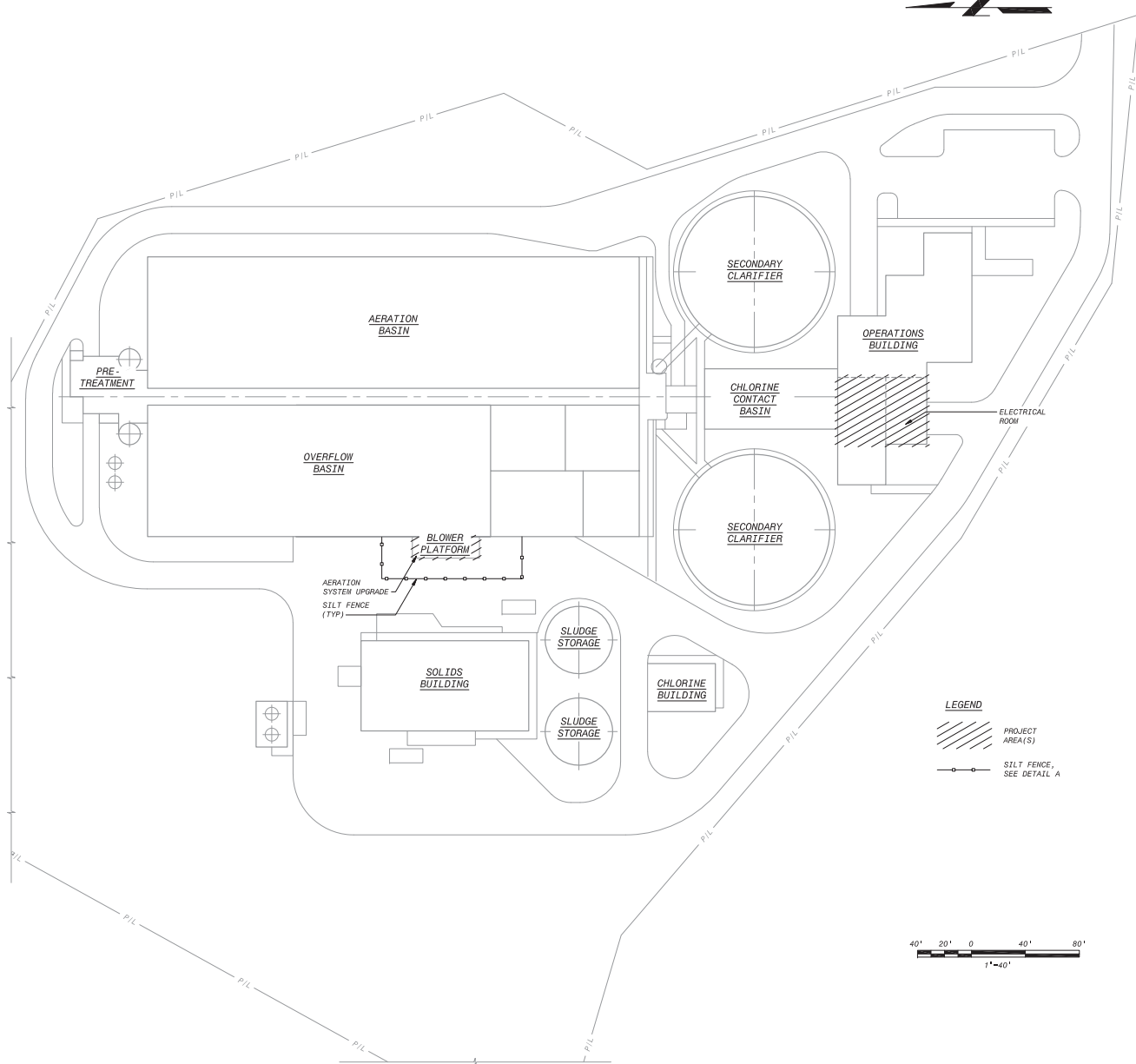
BLACK & VEATCH Black & Veatch Corporation 3111 North University Drive, Suite 700 Coral Springs, FL 33065 Certificate No. 8132	
CITY OF KEY WEST PROTECTION RICHARD A. WHELAN ENVIRONMENTAL PROTECTION PLUMBING, ELECTRICAL AND ELECTRICAL SWITCHGEAR REPLACEMENT	
CIVIL OVERALL SITE PLAN	
DESIGNED: MLW	DATE: FEBRUARY 2021
DETAILED: DJW	
CHECKED: MH, LB	
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
PROJECT NO. 199322	
C-01 SHEET 3 OF 27	

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CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH X 4 INCH LUMBER.
2. STANDARD STRENGTH FILTER FABRIC REQUIRES REINFORCEMENT VIA WIRE FENCE WITH A MINIMUM 14 GAUGE AND MAXIMUM MESH SPACING OF 6 INCHES. EXTRA STRENGTH FILTER FABRIC WITH 6 FEET POST SPACING (AS APPROVED BY ENGINEERS) DOES NOT REQUIRE WIRE MESH SUPPORT FENCE).
3. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
4. SPACE UPRIGHT SUPPORTS NO MORE THAN 10 FEET APART.
5. PROVIDE A TWO FOOT OPENING BETWEEN EVERY SET OF SUPPORTS AND PLACE STONE IN THE OPENING OVER GEOTEXTILE.
6. KEEP SILT FENCE TAUT AND SECURELY STAPLE TO THE UPSLOPE SIDE OF UPRIGHT SUPPORTS. EXTEND GEOTEXTILE UNDER 2x4.
7. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN, OVERLAP, FOLD, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. ATTACH LATHE.
8. PROVIDE A MASTIC SEAL BETWEEN PAVEMENT, GEOTEXTILE, AND 2x4 TO PREVENT SEDIMENT-LOADED WATER FROM ESCAPING BEHIND SILT FENCE INSTALLATION.
9. SECURE BOARDS TO PAVEMENT WITH 400 5 INCH MINIMUM LENGTH NAILS.
10. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES SIX INCHES IN HEIGHT. REPLACE GEOTEXTILE IF TORN. MAINTAIN WATER TIGHT SEAL ALONG BOTTOM. REPLACE STONE IF DISPLACED.



REVISIONS AND RECORDS OF USE NO. BY DATE
BLACK & VEATCH Black & Veatch Corporation 3111 North University Drive, Suite 700 Coral Springs, FL 33065 Certificate No. 8132 Board Home No. 190322
CITY OF KEY WEST PROTECTION RICHARD A. WHELAN ENVIRONMENTAL SERVICES AND ELECTRICAL SWITCHGEAR REPLACEMENT CIVIL STORMWATER POLLUTION PREVENTION PLAN
DESIGNED: MLH DETAILED: DJW CHECKED: MH, LB APPROVED: DATE: FEBRUARY 2021
PROJECT NO. 199322 C-02 SHEET 4 OF 27

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GENERAL

- 1. THE APPLICABLE BUILDING CODE IS THE 2018 INTERNATIONAL BUILDING CODE (IBC) AND THE 2020 FLORIDA BUILDING CODE (FBC), 7TH EDITION.
2. THE REQUIREMENTS INDICATED ON THIS SHEET ARE INTENDED AS A BASIC SUMMARY OF THE MATERIAL AND CONSTRUCTION REQUIREMENTS FOR THE PROJECT.
3. ALL STRUCTURAL RELATED SHOP DRAWINGS SHALL BE REVIEWED BY THE ENGINEER PRIOR TO CONSTRUCTION.
4. STRUCTURES MAY BE BUOYANT WHEN EMPTY DURING CONSTRUCTION. CONTRACTOR SHALL PROTECT STRUCTURES AGAINST FLOTATION UNTIL CONSTRUCTION IS COMPLETE.

CAST-IN-PLACE CONCRETE

- 1. A MINIMUM 28 DAY COMPRESSIVE STRENGTH (f'c) OF 4,000 PSI WAS UTILIZED IN THE DESIGN OF STRUCTURAL REINFORCED CONCRETE.
2. THE LOCATION OF ALL CONSTRUCTION JOINTS AND OTHER TYPES OF JOINTS, OTHER THAN THOSE SPECIFIED OR SHOWN ON THE PLANS, SHALL BE ACCEPTABLE TO THE ENGINEER PRIOR TO PLACING CONCRETE.

REINFORCING STEEL

- 1. ALL REINFORCING BAR SHALL BE GRADE 60, DEFORMED, ASTM A615, UNLESS NOTED OTHERWISE.
2. DIMENSIONS TO REINFORCING BARS ARE TO BAR CENTERLINES, UNLESS NOTED OTHERWISE.
3. NO WELDING OF REINFORCING BARS SHALL BE PERMITTED UNLESS APPROVAL IS OBTAINED FROM THE ENGINEER PRIOR TO CONSTRUCTION.

POST-INSTALLED ANCHORS

- 1. POST-INSTALLED ANCHORS SHALL INCLUDE ADHESIVE ANCHORS (THREADED RODS, BOLTS OR REINFORCING BARS), EXPANSION ANCHORS, AND UNDERCUT ANCHORS INSTALLED INTO HARDENED CONCRETE OR MASONRY.
2. POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE INDICATED ON THE DRAWINGS.
3. CARE SHALL BE TAKEN TO AVOID CONFLICTS WITH EXISTING REINFORCING STEEL AND OTHER EMBEDDED ITEMS WHEN DRILLING HOLES.
4. SUBSTITUTION REQUESTS FOR PRODUCTS OTHER THAN THOSE LISTED IN THE SPECIFICATION OR INDICATED ON THE DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL.
5. UNLESS NOTED OTHERWISE, THE MINIMUM EMBEDMENT PROVIDED FOR ADHESIVE ANCHORED REINFORCING BARS SHALL DEVELOP THE FULL TENSILE STRENGTH OF THE BAR.
6. SPECIAL INSPECTION WILL BE PROVIDED FOR ALL POST-INSTALLED ANCHORS.

STAINLESS STEEL

- 1. STAINLESS STEEL BOLTS SHALL CONFORM TO ASTM F593, ALLOY GROUP 1 OR 2, UNLESS NOTED OTHERWISE.
2. STAINLESS STEEL PLATES SHALL CONFORM TO ASTM A240, TYPE 316L.
3. STAINLESS STEEL STRUCTURAL SHAPES SHALL CONFORM TO ASTM A1069 OR ASTM A276, TYPE 316L.

ALUMINUM

- 1. UNLESS NOTED OTHERWISE, ALUMINUM ALLOY IN ALL ALUMINUM STRUCTURAL MATERIALS SHALL BE 6061-T6.
2. ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE OR DISSIMILAR METALS SHALL BE COATED OR COVERED WITH A HEAVY COAT OF EPOXY ENAMEL TO PREVENT ALUMINUM-CONCRETE REACTION OR ELECTROLYTIC ACTION.

STRUCTURAL NOTES

STRUCTURAL STEEL

- 1. ROLLED WIDE FLANGE SHAPES SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KSI; CHANNELS, PLATES, AND ANGLES A MINIMUM OF 36 KSI; STRUCTURAL PIPES A MINIMUM OF 35 KSI; ROUND STRUCTURAL TUBES A MINIMUM OF 46 KSI, AND RECTANGULAR STRUCTURAL TUBES A MINIMUM OF 50 KSI.
2. WELDING SHALL BE DONE WITH A FILLER MATERIAL HAVING A MINIMUM TENSILE STRENGTH OF 70 KSI.
3. BOLTED CONNECTIONS SHALL USE 3/4" DIA ASTM A325 BOLTS WITH THE THREADS EXCLUDED FROM THE SHEAR PLANE, UNLESS NOTED OTHERWISE.
4. CARBON STEEL OR GALVANIZED STEEL ANCHOR RODS AND ANCHOR BOLTS SHALL CONFORM TO ASTM F1554 GRADE 36.
5. HOLES FOR ANCHOR RODS AND ANCHOR BOLTS IN COLUMN BASE PLATES SHALL BE AS FOLLOWS:
BOLT/ROD 3/4" TO 1" - 5/16" OVERSIZE
BOLT/ROD 1" TO 2" - 1/2" OVERSIZE
BOLTS/RODS OVER 2" - 1" OVERSIZE
AT THE CONTRACTOR'S OPTION, OVERSIZE HOLES LARGER THAN THOSE LISTED ABOVE MAY BE USED, PROVIDED THAT 3/8" PLATE WASHERS ARE ALSO USED AND FIELD WELDED WITH A 5/16" FILLET TO THE BASE PLATE ALONG A MIN OF 3 SIDES.

SOIL AND FOUNDATIONS

- 1. FOUNDATION CONSTRUCTION SHALL NOT BEGIN UNTIL ANY REQUIRED SPECIAL INSPECTION HAS BEEN COMPLETED AND THE CONTRACTOR NOTIFIED TO PROCEED.
2. TO FACILITATE SCHEDULING, AT LEAST 48 HOURS ADVANCE NOTICE SHALL BE GIVEN TO THE ENGINEER PRIOR TO THE REQUIRED INSPECTIONS.
3. UNLESS NOTED OTHERWISE, BACKFILL SHALL NOT BE PLACED AGAINST WALLS WHICH SUPPORT A CONCRETE SLAB OR WALKWAY UNTIL THE TOP SLAB OR WALKWAY HAS BEEN PLACED IN ITS ENTIRETY AND ALL CONCRETE HAS REACHED THE SPECIFIED DESIGN STRENGTH.
4. AUGER CAST PILE CAPACITY IS SHOWN BELOW AND SHALL BE VERIFIED BY CONTRACTOR:
- BEARING = 90 KIPS
- UPLIFT = 40 KIPS
- LATERAL = 4 KIPS

EXISTING STRUCTURES

- 1. THE DRAWINGS DEPICT WORK AT EXISTING STRUCTURES. ALL DIMENSIONS AND ALL DEPICTIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS, STARTING FABRICATION, OR STARTING CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE, REPAIRS OR STRUCTURAL MODIFICATIONS THAT ARE REQUIRED DUE TO DEMOLITION BEYOND THE LIMITS IDENTIFIED ON THE DRAWINGS.
3. REINFORCEMENT FOR ANY EXISTING CONCRETE OR MASONRY ELEMENT SHALL NOT BE DAMAGED UNLESS THE ELEMENT IS TO BE DEMOLISHED.
4. CORE DRILLING AND SAW CUTTING SHALL NOT BE PERFORMED UNLESS INDICATED ON THE DRAWINGS OR APPROVED BY ENGINEER.
5. EXPOSED CONCRETE SURFACES THAT REMAIN AFTER DEMOLITION SHALL BE REPAIRED TO MATCH ADJACENT CONCRETE SURFACES.
6. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, EXPOSED CONCRETE SURFACES WITH REINFORCEMENT, ANCHOR BOLTS, HANGER RODS, OR OTHER EXPOSED METAL EMBEDMENTS SHALL BE REPAIRED BY CUTTING OFF THE METAL AT THE FACE OF THE CONCRETE, GRINDING SMOOTH, AND COATING. COATING SHALL EXTEND A MINIMUM OF 1" BEYOND THE EDGE OF ANY EXPOSED METAL.

LOADING CRITERIA

- 1. DEAD LOAD CALCULATED
2. LIVE LOADS:
BLOWER PLATFORM 250 PSF
3. WIND LOAD:
ULTIMATE DESIGN WIND SPEED 200 MPH
NOMINAL DESIGN WIND SPEED 155 MPH
EXPOSURE 0
RISK CATEGORY III
4. SEISMIC LOAD:
MAPPED MCE SHORT PERIOD SPECTRAL RESPONSE ACCELERATION (Ss) 0.021g
MAPPED MCE ONE SECOND PERIOD SPECTRAL RESPONSE ACCELERATION (S1) 0.013g
DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (Sps) 0.022g
DESIGN SPECTRAL RESPONSE ACCELERATION AT ONE SECOND PERIOD (S1p) 0.021g
SITE CLASS 0
RISK CATEGORY III
SEISMIC DESIGN CATEGORY A
5. SNOW LOAD:
GROUND SNOW LOAD (Pg) ZERO PSF
6. DESIGN FLOOD ELEVATION (DFE) EL. 8.00 (USGS)

SPECIAL INSPECTIONS

- 1. CODE REQUIRED SPECIAL INSPECTIONS AND TESTS WILL BE CONDUCTED BY APPROVED AGENCIES EMPLOYED BY THE OWNER IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE.
2. THE STATEMENT OF SPECIAL INSPECTIONS WILL BE PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE DURING CONSTRUCTION.
3. EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A WIND OR SEISMIC FORCE RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM OR A WIND OR SEISMIC RESISTING COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND OWNER PRIOR TO COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT.
4. SEE THE QUALITY CONTROL SECTION AND THE CODE REQUIRED SPECIAL INSPECTIONS AND PROCEDURES SECTION OF THE SPECIFICATIONS FOR FURTHER CLARIFICATION OF RESPONSIBILITIES.
5. SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE WILL BE PERFORMED AS DESCRIBED IN THE STATEMENT OF SPECIAL INSPECTIONS.
6. STRUCTURAL OBSERVATION WILL BE PERFORMED BY A REGISTERED DESIGN PROFESSIONAL RETAINED BY THE OWNER. THE STRUCTURAL OBSERVER WILL PREPARE A STATEMENT IDENTIFYING THE FREQUENCY AND EXTENT OF THE STRUCTURAL OBSERVATIONS.

Professional Engineer Seal for E. M. A. Pohlman, State of Florida, License No. 100000000, dated 2019/01/11.

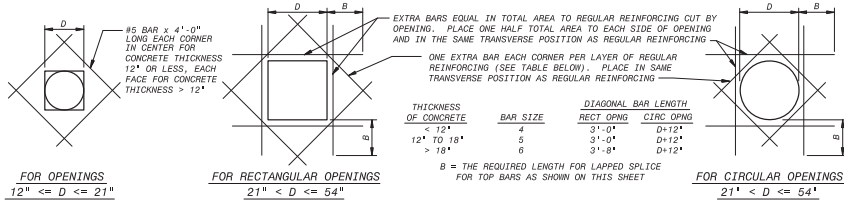
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CITY OF KEY WEST PROTECTION PLAN FOR REMOVAL OF EXISTING ELECTRICAL SWITCHGEAR REPLACEMENT. STRUCTURAL GENERAL NOTES.

DESIGNED: EAP, DETAILED: JPS, CHECKED: MM, LB, APPROVED: EAP, DATE: FEBRUARY 2021, PROJECT NO. 199322, SHEET S-01 OF 27.

FINAL - ISSUED FOR BID

01/20/22

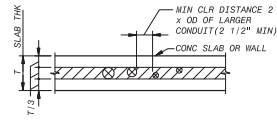


FOR OPENINGS
12" ≤ D ≤ 21"

FOR RECTANGULAR OPENINGS
21" < D ≤ 54"

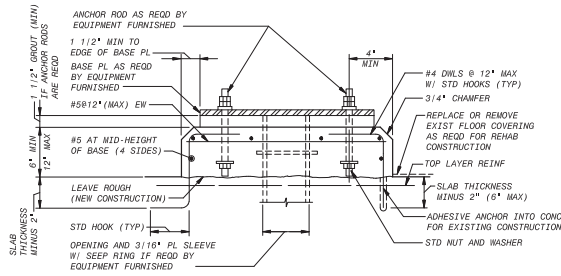
FOR CIRCULAR OPENINGS
21" < D ≤ 54"

TYPICAL EXTRA REINFORCING AT OPENINGS 12" TO ≤ 54"
(TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS)



- NOTES:
1. PLACE CONDUIT ONLY IN SHADED AREA.
2. FOR CONDUIT REQUIREMENTS SEE THE ELECTRICAL DRAWINGS AND SPECIFICATIONS.

CONDUIT PLACING DETAIL
NO SCALE



EQUIPMENT BASE
NO SCALE

LENGTH OF LAPPED SPLICES FOR REINFORCEMENT (INCHES) (f'c=4000 PSI) (UNLESS NOTED OTHERWISE ON THE DRAWINGS)					CONCRETE COVER FOR REINFORCEMENT		
BAR SIZE A	BEAMS & COLUMNS		WALLS & SLABS		BAR SIZE	LOCATION	MINIMUM COVER
	**TOP BARS	OTHERS	**TOP BARS	OTHERS			
3	16	16	16	16	3	UNFORMED SURFACES ADJACENT TO EXCAVATION	3"
4	19	19	19	19	4	SURFACES INSIDE OF OZONE CONTACTORS EXPOSED TO OZONE IN WATER OR AIR	3"
5	24	18	24	19	5	TOP SURFACES OF SLABS THAT ARE SUBMERGED	3"
6	33	26	29	22	6	FORMED SURFACES THAT ARE SUBMERGED, AND FORMED OR TOP SURFACES EXPOSED TO WEATHER, SATURATED AIR, OR EARTH.	2"
7	55	42	48	37	7	OTHER LOCATIONS:	
8	89	53	60	46	8	BEAMS OR GIRDERS	1 1/2"
9	84	65	74	57	9	SLABS, WALLS AND JOISTS	1 1/2"
10	103	79	91	70	10	#5 AND LARGER	1"
11	122	94	108	83	11	#5 AND SMALLER	1"

NOTES:
1. COVER IS MEASURED TO NEAREST BAR, STIRRUP, TIE, OR SPIRAL, AS APPLICABLE.
2. TOLERANCES FOR CONCRETE COVER AND THE FABRICATION AND PLACING OF REINFORCEMENT SHALL CONFORM TO ACI 117.

REVISED AND RECORD OF USE NO. BY DATE

DESIGNED BY: -
 CHECKED BY: MM, LB
 APPROVED: -
 DATE: FEBRUARY 2021

PROJECT NO. 199322

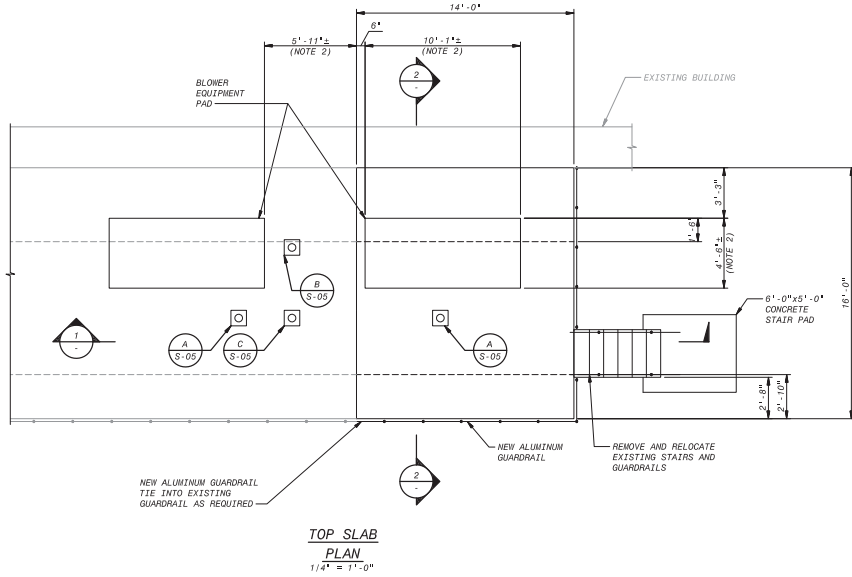
S-02 SHEET 6 OF 27

CITY OF KEY WEST
 RICHARD A. WHELAN ENVIRONMENTAL PROTECTION
 PLANNING DEPARTMENT
 ELECTRICAL SWITCHGEAR REPLACEMENT

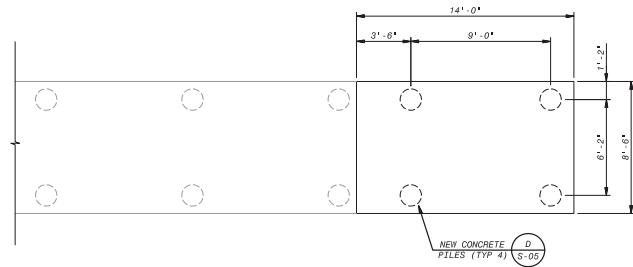
STRUCTURAL
 STANDARD GRATING STAIR DETAILS

BLACK & VEATCH
 Black & Veatch Corporation
 311 North University Drive, Suite 700
 Coral Springs, FL 33065
 Certificate No. 8132
 ELMAS A. POULIADAKI
 Engineer of Record
 Florida License No. 106300

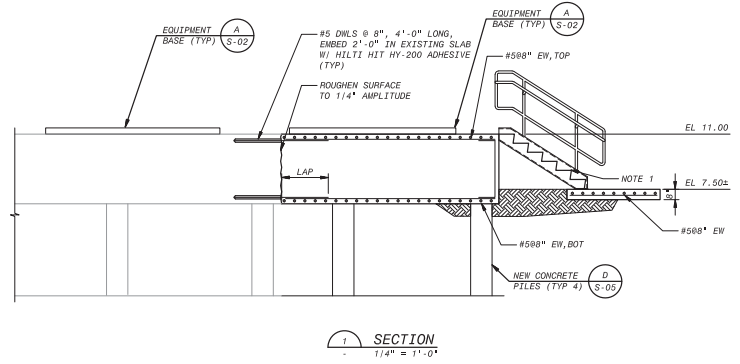
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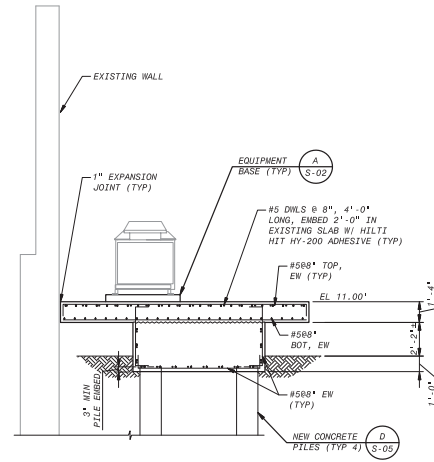
**TOP SLAB
PLAN**
1/4" = 1'-0"



**FOUNDATION
PLAN**
1/4" = 1'-0"



**SECTION
1**
1/4" = 1'-0"



**SECTION
2**
1/4" = 1'-0"

NOTES:

1. CONTRACTOR SHALL CAREFULLY REMOVE EXISTING STAIRS AND GUARDRAILS AND RE-USE THEM AS SHOWN ON THE PLAN. NEW GUARDRAILS WILL BE FURNISHED AND INSTALLED ON THE NEW FOUNDATION.
2. VERIFY PAD SIZE AND LOCATION WITH EQUIPMENT PROVIDED.
3. CONTRACTOR SHALL DEMOLISH EXISTING PAVEMENT TO EXTENTS OF PROPOSED WORK IN THESE DRAWINGS.

NO. 1	DATE	REVISIONS AND RECORDS OF USE	BY

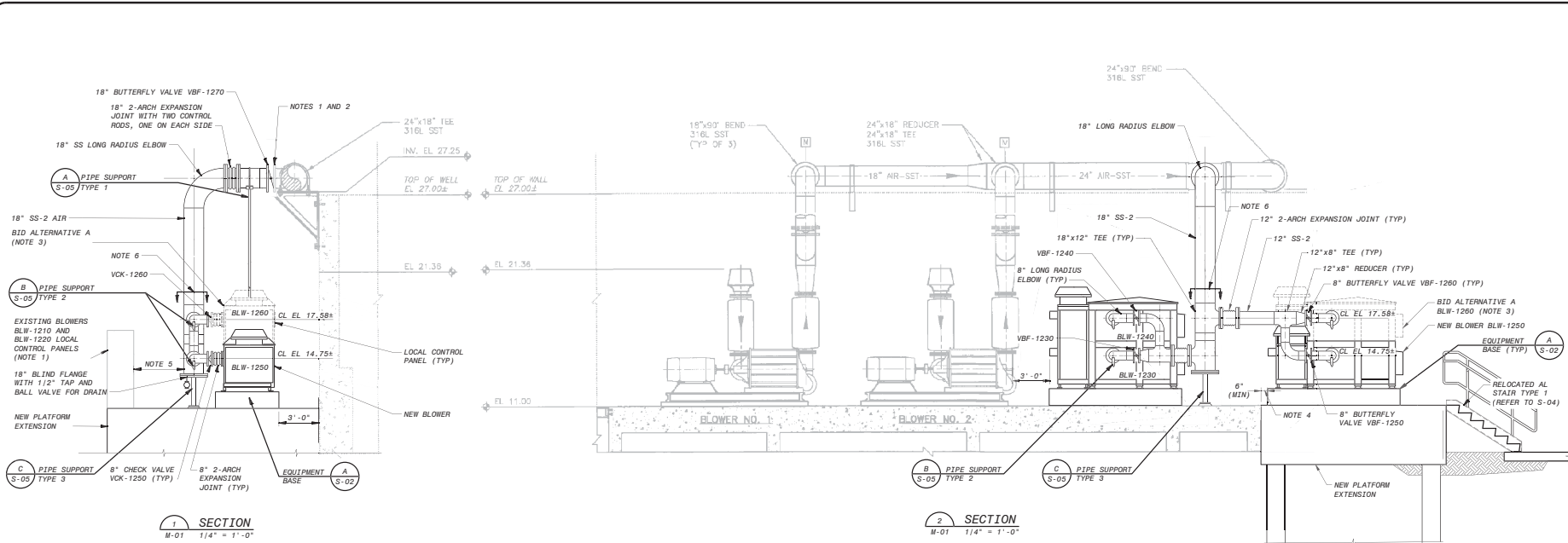
BLACK & VEATCH
 Black & Veatch Corporation
 3111 North Unkenhuth Drive, Suite 700
 Coral Springs, FL 33065
 Certificate No. 8132
 Florida License No. 199322

CITY OF KEY WEST
 RICHARD A. HEERMAN ENVIRONMENTAL PROTECTION
 PLANNING DIVISION
 ELECTRICAL SWITCHGEAR REPLACEMENT
 STRUCTURAL
 BLOWER FOUNDATION PLAN, SECTIONS & DETAILS

DESIGNED: EAP
DETAILED: JPS
CHECKED: MM, LB
APPROVED: EAP
DATE: FEBRUARY 2021

PROJECT NO. 199322
S-04
 SHEET 8 OF 27

FINAL - ISSUED FOR BID



- NOTES:**
- EXACT LOCATION AND DIMENSIONS TO BE FIELD VERIFIED BY CONTRACTOR.
 - REMOVE EXISTING BLIND FLANGE AND INSTALL BUTTERFLY VALVE.
 - BLW-1260 AND ASSOCIATED EXPANSION JOINT AND CHECK VALVE CORRESPOND TO BID ALTERNATIVE A. WELD FLANGE WITH BLIND FLANGE AT ELBOW.
 - EQUIPMENT PAD SHALL BE A MINIMUM OF 6 INCHES AWAY FROM EDGE OF NEW AND EXISTING PLATFORMS.
 - 3'-0" MINIMUM CLEARANCE BETWEEN EXISTING LCP AND PIPE.
 - PIPE SHALL BE INSULATED UP TO 8 FEET ABOVE FINISHED FLOOR. SEE MECHANICAL INSULATION SECTION 15250 FOR INSULATION SPECIFICATIONS.

NO. 1	DATE	REVISIONS AND RECORD OF USE	NO.	BY



BLACK & VEATCH
 Black & Veatch Corporation
 311 North University Drive, Suite 700
 Coral Springs, FL 33065
 Florida License No.: 1000242
 Engineer of Record:
 LUCAS ROTHOFF
 License No. 1000242

CITY OF KEY WEST
 RICHARD A. WEHMAN ENVIRONMENTAL PROTECTION
 PLANNING, DESIGN, CONSTRUCTION AND
 ELECTRICAL SWITCHGEAR REPLACEMENT
 MECHANICAL PROCESS
 AERATION SYSTEM UPGRADE SECTION

DESIGNED: RRT
 DETAILED: DJW
 CHECKED: MW, LB
 APPROVED:
 DATE: FEBRUARY 2021

PROJECT NO.
 199322
M-02
 SHEET
 11 OF 27

ELECTRICAL ABBREVIATIONS & NOTES

ELECTRICAL GENERAL NOTES

- SOLID LINES (—————) INDICATE NEW WORK OR EQUIPMENT.
- SCREENED LINES (————) INDICATE EXISTING WORK OR EQUIPMENT.
- DASHED LINES (- - - - -) INDICATE FUTURE WORK OR EQUIPMENT.
- REFER TO INDIVIDUAL DISCIPLINE CONTRACT DRAWINGS FOR ADDITIONAL ABBREVIATIONS, DETAILS, AND GENERAL DESIGN NOTES.
- LEGEND SHEETS ARE GENERAL. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES:
 - ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.
 - FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, BUILDING FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. BUILDING FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
 - SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.
 - DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE, CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.

AREA DESIGNATIONS

THE SPECIAL AREA DESIGNATION BOXES, AS DEFINED BELOW, ARE LOCATED ON THE PLAN DRAWINGS TO DEFINE ELECTRICAL INSTALLATION REQUIREMENTS. DESIGNATION BOXES ARE LOCATED WITHIN ROOM OR BELOW ROOM NUMBER. ALL INDOOR AREAS NOT INDICATED OTHERWISE ARE AREA TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES.

AREA TYPE 1A

CORROSIVE CHEMICAL FEED AND STORAGE ROOMS. CONDUIT SYSTEM SHALL BE EXPOSED SCHEDULE 80 PVC RIGID NON-METALLIC CONDUIT WITH PVC FITTINGS, BOXES AND ACCESSORIES.

AREA TYPE 4

INDOOR WET LOCATIONS SUCH AS VAULTS, HOSEROOM AREAS, BASEMENTS, ETC. MINIMUM NEMA TYPE 4 ENCLOSURE FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM.

AREA TYPE 7A

CLASS I, DIVISION 1 AREA AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.

AREA TYPE 7B

CLASS I, DIVISION 2, GROUP C AND D (METHANE, GASOLINE) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.

AREA TYPE 12

INDOOR, DRY, DIRTY AREA. REQUIRES MINIMUM NEMA TYPE 12 GASKETED ENCLOSURES FOR ALL EQUIPMENT AND GASKETED FITTINGS IN CONDUIT SYSTEMS.

GENERAL REQUIREMENTS

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATION.
- SPARE WIRES SHALL BE TAPED AND COILED AND LABELED TO INDICATE WHERE OTHER END OF SPARE WIRE IS LOCATED.
- IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
- LIGHTING AND RECEPTACLE CIRCUITS DESTOMATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTABLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12AWG. CONDUIT FOR LIGHTING, RECEPTABLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
- IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC. NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.

ELECTRICAL ABBREVIATIONS

A

A AMBER, AMPERE, ALARM
 AC ALTERNATING CURRENT
 ACB AIR CIRCUIT BREAKER
 ACR ACCESS CARD READER
 AF AMPERE FRAME
 AFD ADJUSTABLE FREQUENCY DRIVE
 AFRD ARC-FLASH REDUCTION DEVICE
 AN AMINER
 ANN ANNUNCIATOR
 AR ALARM RELAY
 AS AMINER SWITCH, AMPERE SENSOR
 AT AMPERE TRIP
 ATS AUTOMATIC TRANSFER SWITCH
 AUX AUXILIARY
 AWG AMERICAN WIRE GAUGE

B

B BUS
 BC BATTERY CHARGER
 BKR BREAKER
 BR BRAKE
 BT BEARING TEMPERATURE

C

C CLOSE, COUNTER, CONTACTOR, CONTROL,
 CCTV CAMERA
 CAP CAPACITOR
 CB CIRCUIT BREAKER
 CB*AN CIRCUIT BREAKER AUXILIARY CONTACT
 (OPEN WHEN BREAKER IS OPEN)
 CB*BN CIRCUIT BREAKER AUXILIARY CONTACT
 (CLOSED WHEN BREAKER IS OPEN)

CD

CD CONTROL DAMPER
 CI CELL INTERLOCK
 CKT CIRCUIT
 CL2 CHLORINE
 COS CABLE OPERATED SWITCH
 CP CONTROL PANEL

CPT

CPT CONTROL POWER TRANSFORMER
 CR CURRENT OF CONTROL RELAY, CARD READER
 CS CONTROL STATION
 CT CYCLE TIMER OR CURRENT TRANSFORMER
 CTC CYCLE TIMER CLUTCH
 CTM CYCLE TIMER MONITOR
 2/C 2 CONDUCTOR
 4"/C 4" CONDUIT

D

DC DIRECT CURRENT, DOOR CONTACT
 DI DOOR INTERLOCK
 DM DAMPER MOTOR, DEMAND METER,
 DIMMER SWITCH
 DI DOOR INTERLOCK
 DM DAMPER MOTOR, DEMAND METER,
 DIMMER SWITCH

DPST

DPST DOUBLE POLE DOUBLE THROW
 DPST DOUBLE POLE SINGLE THROW
 DPR DIFFERENTIAL PRESSURE REGULATOR
 DPS DIFFERENTIAL PRESSURE SWITCH
 DS DISCONNECT SWITCH, DOOR SWITCH,
 DESKTOP SWITCH
 DVLS DISCHARGE VALVE LIMIT SWITCH

E

E ELECTRIC OPERATOR FOR CONTROL DAMPER
 OR VALVE
 EC EMPTY CONDUIT
 EDS ELECTRICAL DOOR STRIKE
 EL ELEVATION, EMERGENCY LIGHT
 EHM ELECTRICAL HANHOLE
 ER ELECTRODE RELAY
 ES END SWITCH, REQUEST TO EXIT SENSOR
 E-STOP EMERGENCY STOP
 ETM ELAPSED TIME METER
 EX EXISTING
 EXP EXPLOSION PROOF

F

F FORWARD, FIELD
 F FIBER OPTIC
 FF FIBER OPTIC
 FPR FEEDER PROTECTION RELAY
 FS FLOW SWITCH

G

G GREEN, GROUND, GENERATOR,
 GROUND FAULT
 GD GROUND DETECTOR
 GEN GENERATOR
 GFCT, GFI GROUND FAULT CURRENT INTERRUPTOR,
 GROUND FAULT INTERRUPTOR
 GLS GEARED LIMIT SWITCH
 GPR GENERATOR PROTECTION RELAY
 GND GROUND
 #GG #8 GROUND WIRE

H

H HIGH, HUMIDISTAT
 HH HANDLE
 HMT HIGH MOTOR TEMPERATURE
 HOA HAND-OFF-AUTO
 HOR HAND-OFF-REMOTE
 HP HORSEPOWER
 HS HAND STATION
 HWC HIGH WATER CUTOFF
 HZ HERTZ (CYCLE)

I

I/O INPUT/OUTPUT
 I INSTANTANEOUS
 IJB INTERCOM JUNCTION BOX
 J, JB JUNCTION BOX

K

K KEY INTERLOCK
 KAIC THOUSAND AMPERES INTERRUPTING CURRENT
 KOBEL THOUSAND CIRCULAR MIL
 KO KEY OPERATED
 KV KILOVOLT
 KVA KILOVOLT AMPERE
 KVAR KILOVAR
 KW KILOWATT
 KWH KILOWATT HOUR

L

L LOW, LEVEL, LONG-TIME
 LA LIGHTNING ARRESTER
 LAN LOCAL AREA NETWORK
 LC LIGHTING CONTACTOR
 LCE LIGHTING CONTACTOR ENCLOSURE
 LCE LIGHTING CONTROL ENCLOSURE
 LCP LOCAL CONTROL PANEL
 LCS LOCAL CONTROL STATION
 LOA LOCAL-OFF-AUTO
 LOR LOCAL-OFF-REMOTE
 LOS LOCK OUT STOP
 LP LIGHTING PANEL
 LS LIMIT OR LEVEL SWITCH
 LIT LIGHTING
 LWCO LOW WATER CUTOFF

M

M MAGNETIC MOTOR STARTER
 MA MILLIAMPERE
 MCB MAIN CIRCUIT BREAKER
 MCC MOTOR CONTROL CENTER
 MCLU MOTOR CONTROL LINEUP
 MD MISTYRE DETECTOR, MOTION DETECTOR
 MDL MAGNETIC DOOR LOCK
 MFR MANUFACTURER
 MH HANDLE, MOUNTING HEIGHT
 MOV MOTOR OPERATED VALVE
 MPR MOTOR PROTECTION RELAY
 MS MANUAL MOTOR STARTER
 MSH MOTOR SPACE HEATER
 MTS MANUAL TRANSFER SWITCH
 MVLV MEDIUM VOLTAGE
 MVA MEGAVOLT AMPERE

N

N NEUTRAL
 NGR NEUTRAL GROUNDING RESISTOR
 NGT NEUTRAL GROUNDING TRANSFORMER
 NO NORMALLY CLOSED
 NO NORMALLY OPEN, NUMBER

O

O OPEN
 OL OVERLOAD
 OGA ON-OFF-AUTO
 OOR ON-OFF-REMOTE
 OS OCCUPANCY SENSOR
 O/U OVER/UNDER

P

P PRIMARY, POWER, POLE
 PCS PLANT CONTROL SYSTEM
 PB PUSH BUTTON, PULL BOX
 PE PHOTOELECTRIC SENSOR, PHOTOCELL
 PF POWER FACTOR
 PFCC POWER FACTOR CORRECTION CAPACITOR
 PH PHASE
 PL PILOT LIGHT
 PLC PROGRAMMABLE LOGIC CONTROLLER
 PP POWER PANEL
 PR PAIR
 PRS PROXIMITY SWITCH
 PS PRESSURE SWITCH
 PT POTENTIAL TRANSFORMER, PROGRAM TIMER

Q

Q NOT USED

R

R RED, RAISE, RELAY, REVERSE
 RECIP RECEPTACLE
 RES RESISTOR
 RH REMOTE HANDSET
 RT REPEATING TIMER
 RTD RESISTANCE TEMPERATURE DETECTOR
 RTU REMOTE TERMINAL UNIT
 RVSS REDUCED VOLTAGE SOLID STATE STARTER

S

S SHORT-TIME, SHIELDED, STARTER
 SA SURGE ARRESTER, SPEAKER AMPLIFIER
 SCADA SUPERVISORY CONTROL AND
 DATA ACQUISITION
 SDF SULFUR HEXAFLUORIDE
 SH SPACE HEATER
 SN SOLID NEUTRAL
 SO SOLENOID OILER
 SP SINGLE POLE
 SPD SURGE PROTECTION DEVICE
 SPOT SINGLE POLE DOUBLE THROW
 SPST SINGLE POLE SINGLE THROW
 SS SELECTOR SWITCH, START/STOP, STAINLESS STEEL
 SSM SOLID-STATE METERING
 SSS SOLID STATE STARTER
 SST SOLID-STATE TRIP
 SUPV SUPERVISORY CONTROL
 SV SOLENOID VALVE
 SWB, SWBD SWITCHBOARD
 SW, SWR SWITCHGEAR

T

T THERMOSTAT, TIMER, TOTALIZER,
 TRANSFORMER
 TACH TACHOMETER
 TACH TACHOMETER
 TB TERMINAL BLOCK
 TC TIMER CLUTCH
 TD TIME DELAY RELAY
 TE TEMPERATURE
 TM THERM MOTOR
 TN TORQUE
 TR THERM RELAY, TRIAD
 TS TEMPERATURE SWITCH
 TTB TELEPHONE TERMINAL BOARD

U

UG UNDERGROUND
 UPS UNINTERRUPTIBLE POWER SUPPLY

V

V VOLTS, VOLTAGE RESTRAINED
 VA VOLT AMPERE
 VAR VARIMETER
 VFD VARIABLE FREQUENCY DRIVE
 VIM VACUUM INTERRUPTED
 VLS VALVE LIMIT SWITCH
 VMT VOLTMETER
 VPI VALVE POSITION INDICATOR
 VS VOLTMETER SWITCH

W

W WHITE, WATTS
 WH WATTHOUR METER
 WM WATT METER
 WP WEATHERPROOF
 WPI WEATHERPROOF IN-USE
 WS WALL STATION

X

X AUXILIARY RELAY
 XFMR TRANSFORMER
 XP EXPLOSION PROOF

Y

Y YELLOW

Z

Z AUXILIARY RELAY, IMPEDANCE
 ZS POSITION SWITCH
 ZSS ZERO SPEED SWITCH

1-1PR#16S ONE, SINGLE PAIR, TWISTED
 SHIELDED #16 CABLE

3-7PC#14 THREE, SINGLE, SEVEN CONDUCTOR #14
 MULTICONDUCTOR CONTROL CABLES

REVISED AND RECORD OF USE NO. BY DATE

NO. 33376

STATE OF TEXAS

ENGINEER OF RECORD

RICHARD D. VAYTOR

Professional License No. 8132

Ex. 02245

BLACK & VEATCH

Black & Veatch Corporation
 3111 North University Drive, Suite 700
 Coral Springs, FL 33065

Professional License No. 8132
 Ex. 02245

CITY OF KEY WEST PROTECTION
 RICHARD A. HEERAN, ENGINEER OF RECORD AND
 ELECTRICAL SWITCHGEAR REPLACEMENT

ELECTRICAL ABBREVIATIONS & NOTES

DESIGNED: DG
 DETAILED: AMJ
 CHECKED: ABT
 APPROVED:

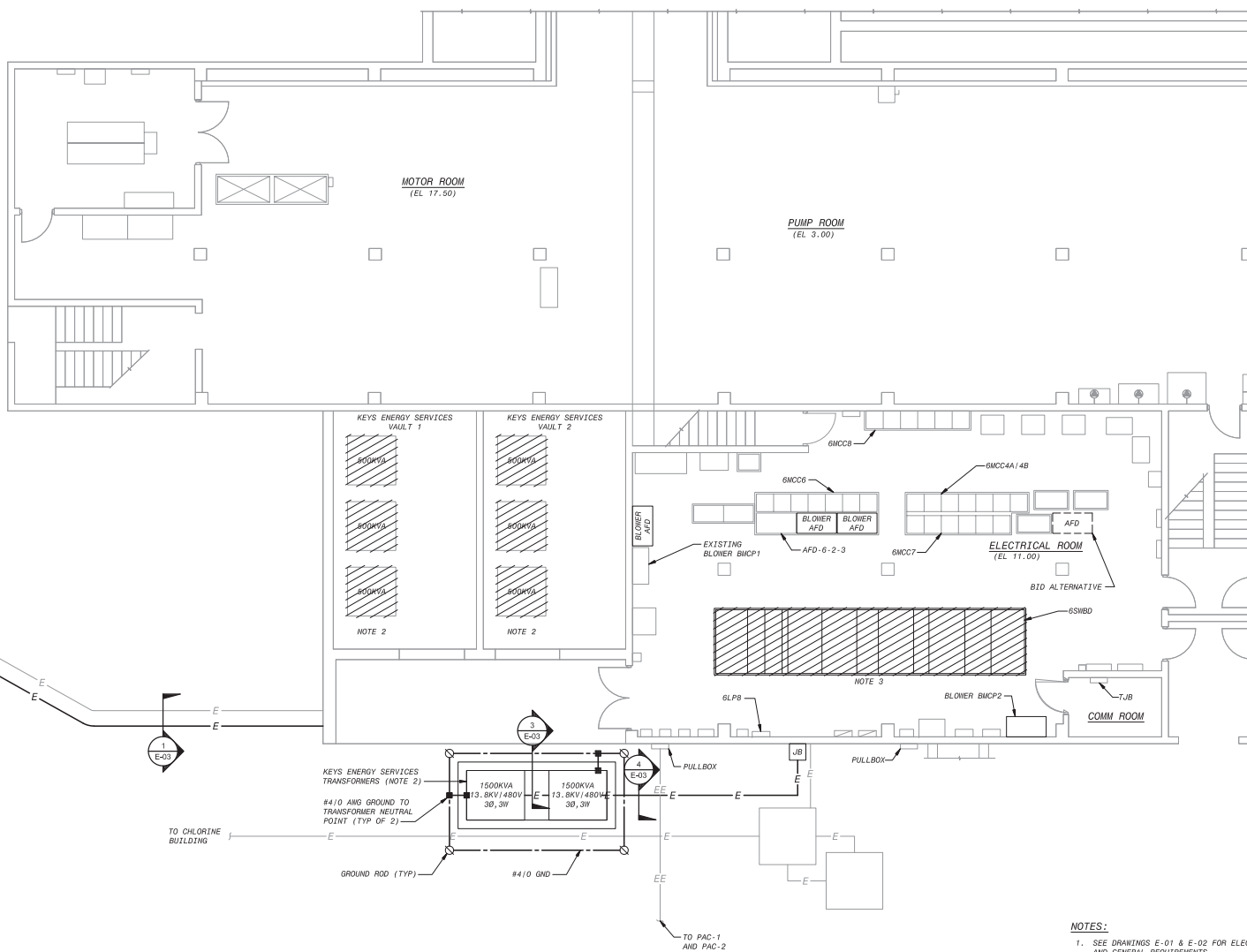
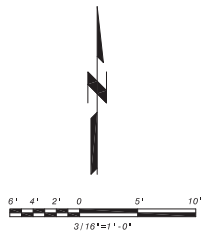
DATE: FEBRUARY 2021

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
 199322

E-02
 SHEET
 13 OF 27

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SEE SHEET E-03 FOR CONTINUATION



NOTES:

1. SEE DRAWINGS E-01 & E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. KEYS ENERGY SERVICES TO REMOVE EXISTING TRANSFORMERS AND TO INSTALL TWO NEW 1500KVA TRANSFORMERS. CONTRACTOR SHALL COORDINATE WITH KEYS ENERGY SERVICES AND PROVIDE TRANSFORMER CONCRETE PAD PER UTILITY STANDARDS. CONTRACTOR SHALL SUPPLY GROUNDING ELECTRODE SYSTEM PER SPECIFICATIONS AND DRAWINGS.
3. GSWBD TO BE REPLACED IN KIND AS INDICATED IN THE SPECIFICATIONS. CABLES TO EXISTING LOADS WILL BE RE-LANDED AS INDICATED ON THE ONELINES. SPLICES WILL BE NOT ALLOWED UNLESS WITH THE APPROVAL OF THE ENGINEER.

ELECTRICAL ROOM POWER PLAN
3/16" = 1'-0"

FINAL - ISSUED FOR BID

NO.	DATE	REVISIONS AND RECORDS OF USE	BY	CHK

THE PROFESSIONAL SEAL OF THE ENGINEER IS A PUBLIC OFFICIAL AND IS TO BE USED ONLY FOR THE PROJECT AND FOR THE DATE AND SIGNATURE INDICATED THEREON. IT IS TO BE KEPT IN THE OFFICE OF THE ENGINEER AND IS TO BE RETURNED TO THE BOARD OF PROFESSIONAL ENGINEERS UPON THE ENGINEER'S DEATH OR RESIGNATION FROM THE PROFESSION.

DATE: _____
 ENGINEER OF RECORD:
 RICHARD D. WATSON
 Board License No.: 199322

BLACK & VEATCH
 Black & Veatch Corporation
 3111 North University Drive, Suite 700
 Coral Springs, FL 33065
 Certificate No. 8132

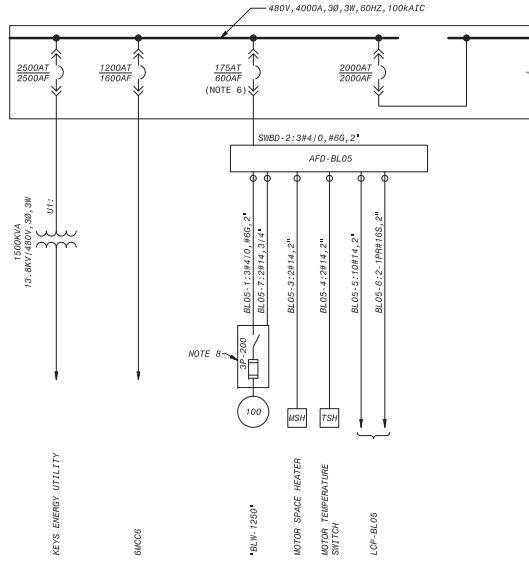
CITY OF KEY WEST
 RICHARD A. WHELAN ENVIRONMENTAL PROTECTION
 PLANNING DIVISION
 ELECTRICAL SWITCHGEAR REPLACEMENT
 OPERATIONS BUILDING POWER PLAN

DESIGNED: DG
 DETAILED: TLK
 CHECKED:
 APPROVED: RDJ
 DATE: FEBRUARY 2021

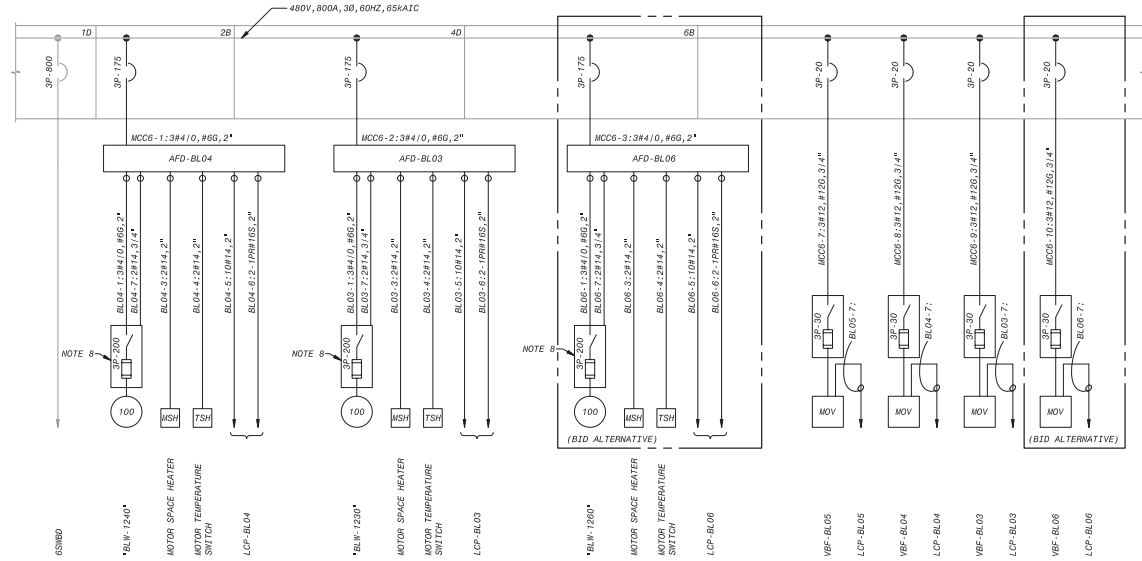
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
 199322

E-04
 SHEET
 15 OF 27



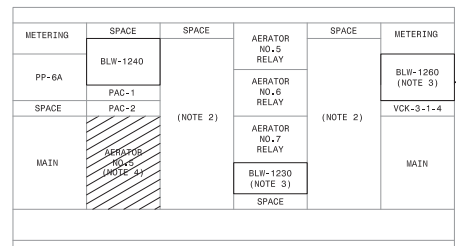
6SWBD PARTIAL ONE-LINE DIAGRAM
(OPERATIONS BUILDING)



EXISTING 6MCC6 PARTIAL ONE-LINE DIAGRAM
(OPERATIONS BUILDING)

30"	22"	22"	30"	30"	22"	22"	30"	22"	30"	22"	22"	30"
MAIN METERING	SPACE	SPACE	TRANSFER SCHEME	MAIN METERING	SPACE	SPACE	TRANSFER SCHEME	P-6-2-3 600A	TRANSFER SCHEME	SPACE	SPACE	EG METERING
MAIN 400A	6MCC7 800A	10SHBD 800A	TIE 400A	MAIN 400A	P-6-3-1 600A	6MCC4A 800A	TIE 400A	P-6-2-1 1200A	TIE 400A	P-6-3-3 600A	SPACE	EG MATN 400A
SPD	6MCC6 1200A	6MCC8A 1200A		SPD	10CB1 600A	2MCC1A 600A		P-6-3-2 600A		P-6-2-2 1200A	2MCC1B 600A	SPD
	6MCC5 1200A	AFD-BL05 600A			BLOWER2 800A	6MCC6B 1200A		6MCC8B 1200A		BLOWER1 800A	6MCC4B 600A	
29'-10"												

6SWBD FRONT ELEVATION (NOTE 6)
NO SCALE

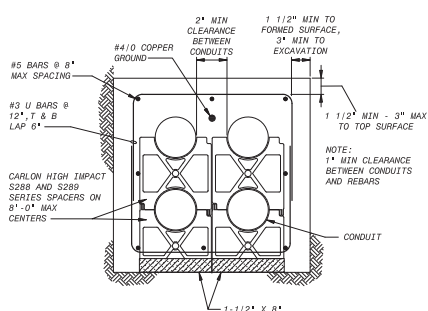


EXISTING 6MCC6 FRONT ELEVATION (NOTE 7)
NO SCALE

- NOTES:**
- SEE DRAWINGS E-01 & E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - RELABEL EXISTING STARTERS AS SPARE.
 - CONTRACTOR SHALL INSTALL NEW 175A BREAKER IN EXISTING SPACE.
 - CONTRACTOR SHALL DEMOLISH EXISTING AERATOR NO.5 STARTER AND INSTALL NEW BREAKERS IN PLACE.
 - CONTRACTOR SHALL REUSE EXISTING 400A FRAME BREAKER AND SET TRIP TO 175A.
 - EXISTING 6SWBD IS A WESTINGHOUSE PON-R-LINE WRI SWITCHBOARD.
 - EXISTING 6MCC6 IS A WESTINGHOUSE SERIES 2100 MOTOR CONTROL CENTER.
 - DISCONNECTS FOR AFD DRIVEN MOTORS SHALL INCLUDE AUXILIARY POSITION FEEDBACK SWITCH FOR USE IN SHUTDOWN OF THE AFD. FUSES SHALL BE SIZED ACCORDING TO MANUFACTURER RECOMMENDATION. SEE SCHEMATIC E-09 FOR DETAILS.

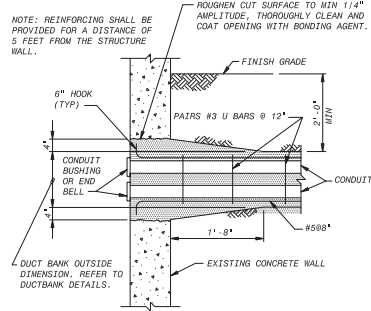
NO. 1	DATE	REVISIONS AND RECORD OF USE	NO.	BY	DATE
BLACK & VEATCH Black & Veatch Corporation 3111 North University Drive, Suite 700 Coral Springs, FL 33065 Florida License No. 8132 Exp. 03/31/2025					
CITY OF KEY WEST RICHARD A. WHELAN ENVIRONMENTAL ENGINEER AND ELECTRICAL SWITCHGEAR REPLACEMENT ELECTRICAL SWITCHBOARD & MCC ONE-LINE DIAGRAM					
DESIGNED: DG					
DETAILED: TLK					
CHECKED:					
APPROVED: RD7					
DATE: FEBRUARY 2021					
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE					
PROJECT NO. 199322					
E-08 SHEET 19 OF 27					

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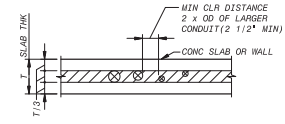


TYPICAL DUCT BANK SECTION
NO SCALE

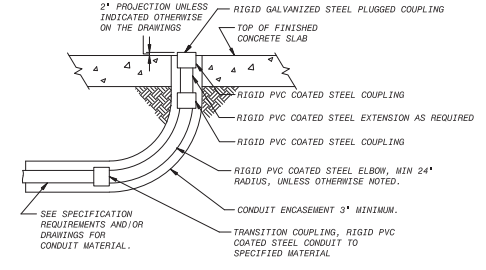
INSTALL REINFORCING ONLY WHERE SPECIFIED OR INDICATED ON THE DRAWINGS.



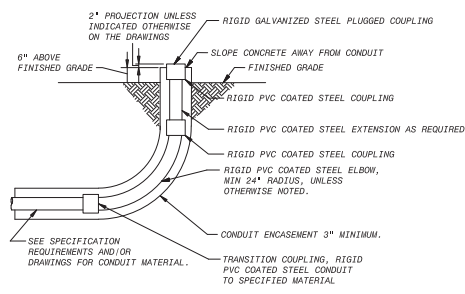
TYPICAL UNDERGROUND DUCT BANK ENTRANCE DETAIL
NO SCALE
NOTE: FOR EXISTING WALL



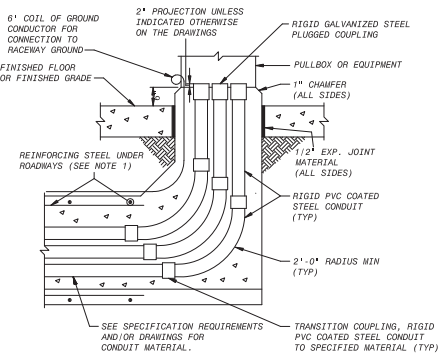
CONDUIT PLACING DETAIL
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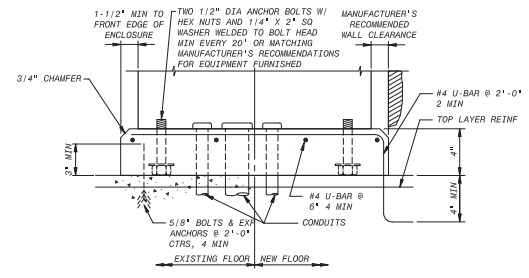
TYPICAL CONDUIT RISER TERMINATING IN CONCRETE SLAB
NO SCALE



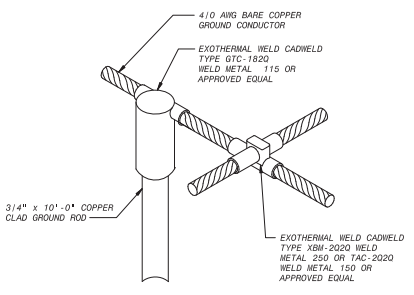
TYPICAL CONDUIT RISER TERMINATING IN SOIL
NO SCALE



TYPICAL DUCT BANK RISER CONSTRUCTION
NO SCALE



ELECTRICAL EQUIPMENT BASE
NO SCALE



TYPICAL EXOTHERMAL WELD GROUND ROD AT CROSS OR TEE CONNECTION
NO SCALE

DESIGNED: DG	DATE: _____
DETAILED: TLK	REVISIONS AND RECORDS OF USE: NO. BY (DATE)
CHECKED: _____	
APPROVED: RD7	
DATE: FEBRUARY 2021	

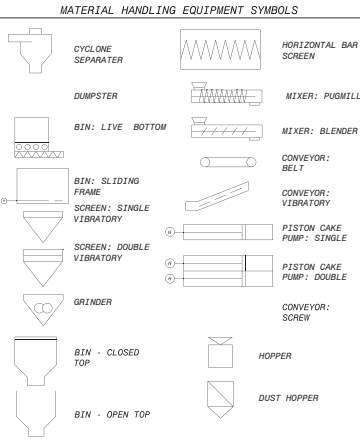
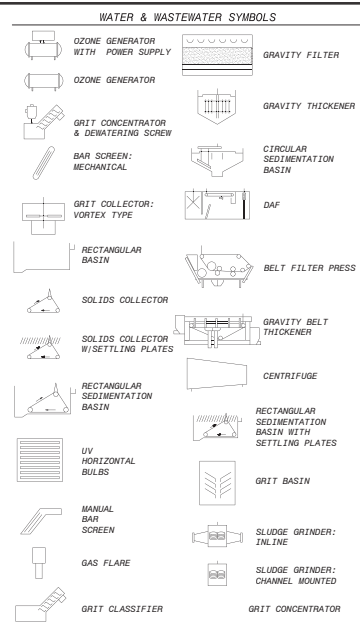
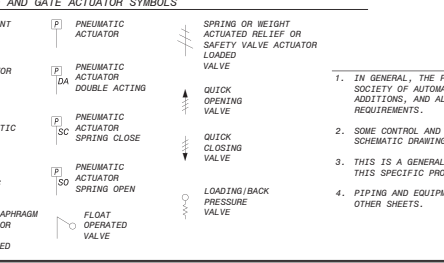
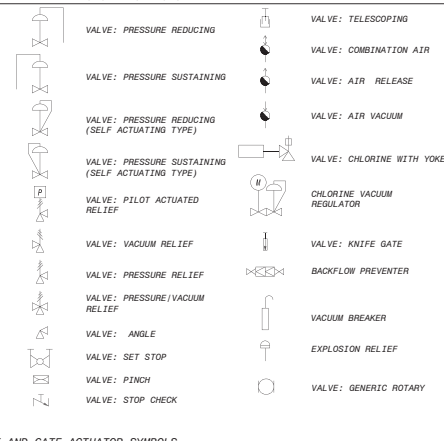
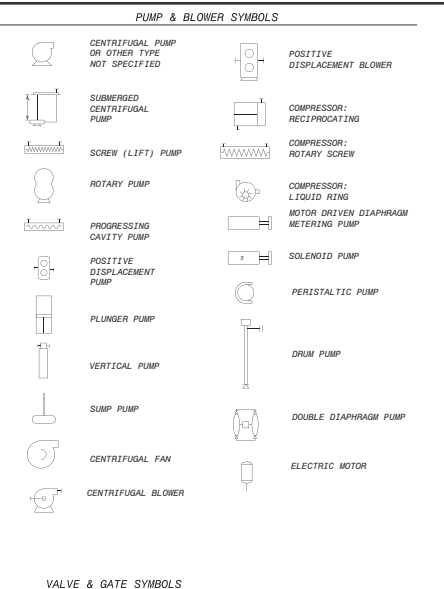
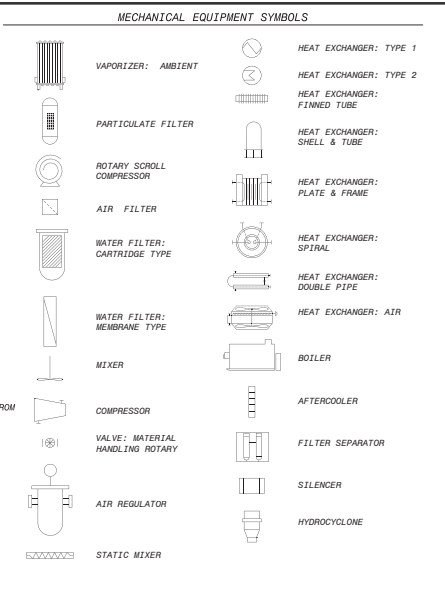
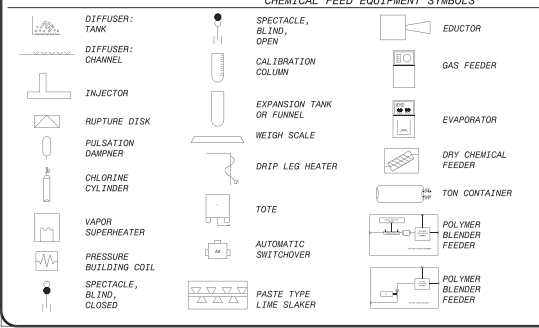
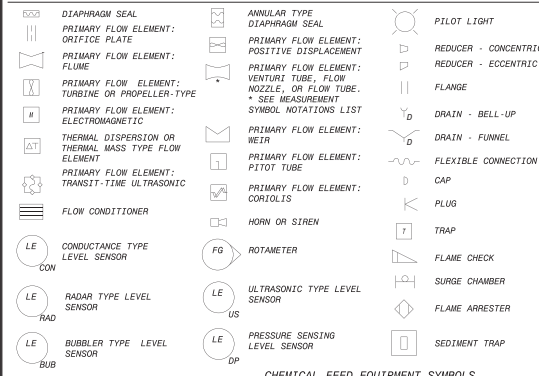
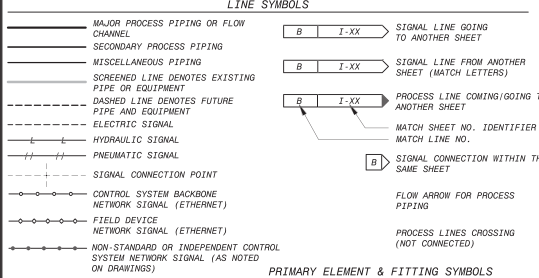
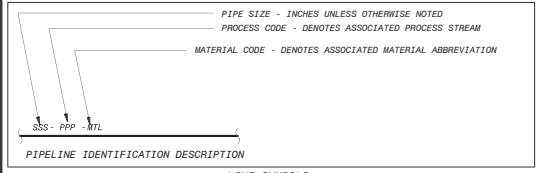
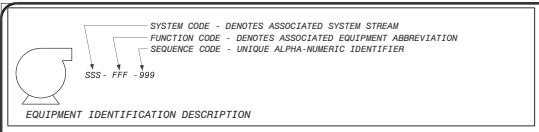
0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE
 PROJECT NO. 199322
 SHEET E-10 OF 27

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 3111 North University Drive, Suite 700
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 Florida License No. 199322

CITY OF KEY WEST
 RICHARD A. WHELAN ENVIRONMENTAL PROTECTION
 PLUMBING SYSTEMS AND ELECTRICAL SWITCHGEAR REPLACEMENT
 ELECTRICAL DETAILS

DESIGNED: DG
 DETAILED: TLK
 CHECKED: _____
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 DATE: FEBRUARY 2021
 PROJECT NO. 199322
 SHEET E-10 OF 27

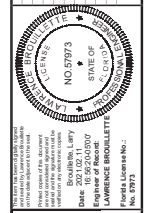
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GENERAL NOTES

- IN GENERAL, THE P&ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INTERNATIONAL SOCIETY OF AUTOMATION, STANDARD PRACTICE ANSI/ISA-5.1 (2009). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
- SOME CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P&ID DRAWINGS.
- THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- PIPING AND EQUIPMENT LEGEND APPLIES TO P&ID SHEETS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.

NO. 19322	REVISED AND RECORD OF USE	NO. 19322
DATE:		DATE:



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CITY OF KEY WEST
 RICHARD A. WHELAN ENVIRONMENTAL PROTECTION
 PLANT OPERATIONS MAINTENANCE AND
 ELECTRICAL SWITCHGEAR REPLACEMENT
 INSTRUMENTATION
 P&ID - LEGEND AND ABBREVIATIONS
 SHEET 1 OF 3

DESIGNED: LJB
DETAILED: LJB
CHECKED: SAK
APPROVED: LJB
DATE: FEBRUARY 2021
PROJECT NO. 199322
SHEET 22 OF 27

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SYSTEM CODE ABBREVIATIONS	
ACE	ACETIC ACID
ACT	ACTIVATED CARBON - GRANULAR
GAC	GAS LINE
AIR	AERATION AIR/PROCESS AIR
AER	AERATION SYSTEM
AW	AIR WASH
ALS	ALUMINUM SULFATE
NS04	AMMONIUM SULFATE
NH3	ANHYDROUS AMMONIA
AS	ANTI-SEALANT
AMH	AQUA AMMONIA
ARG	ARGON
ASH	ASH
BMF	BACKWASH - MEMBRANE/FILTER
BAL	BALLASTED FLOCCULATION
B10	BIOSOLIDS
BIT	BIOTOWER
BS	BLENDED SLOUGE
BMR	BRINE
LOX	LIQUID OXYGEN
CACL	CALCIUM HYPOCHLORITE
CATS	CALCIUM THIOSULFATE
CO2	CARBON DIOXIDE
CAS	CARBON SLURRY
CO3	CARBONIC ACID
CEV	CENTRATE
CEB	CHEMICAL ENHANCED BACKWASH - MEMBRANE
CL2	CHLORINE
CL02	CHLORINE DIOXIDE
CA	CITRIC ACID
CIP	CLEAN IN PLACE
COA	COAGULATION
CAI	COMPRESSED AIR - INSTRUMENT
CMS	COMPRESSED AIR - SERVICE
CUS	COPPER SULFATE
CI	CORROSION INHIBITOR
DCL	DECHLORINATION
DET	DETERGENT
DWT	DEWATERING
DIE	DIESEL FUEL
DGG	DIGESTER GAS
DM	DIGESTER GAS MIXING
DSD	DIGESTER SLOUGE
DGA	DIGESTION - AEROBIC
DMA	DIGESTION - ANAEROBIC
DIF	DISSOLVED AIR FLATATION
D10	DISSOLVED AIR FLATATION BASIN
DWH	DRAINAGE
EPH	EFFLUENT PUMPING
EXH	ENGINE EXHAUST
EQB	EQUALIZATION BASIN
FEC	FERRIC CHLORIDE
FES	FERRIC SULFATE
FMS	FERRUS CHLORIDE
FRS	FERRUS SULFATE
FLT	FILTRATION

SYSTEM CODE ABBREVIATIONS	
RES	RESIDUALS
RAS	RETURN ACTIVATED SLOUGE
RCS	REVERSE OSMOSIS
RSC	SCREENINGS
SSL	SECONDARY CLARIFICATION
SSC	SECONDARY SCUM
SEP	SEPTAGE
SET	SETTLED WATER
SEV	SEWAGE
NAC	SODA ASH
NAL	SODIUM ALUMINATE
NAM	SODIUM ALUMINATE
NBC	SODIUM BICARBONATE
NBS	SODIUM BISULFITE
NCL	SODIUM CHLORIDE
NCL2	SODIUM CHLORITE
NFL	SODIUM FLUORIDE
NAH	SODIUM HEXAMETAPHOSPHATE
NOH	SODIUM HYDROXIDE
NOCL	SODIUM HYPOCHLORITE
NSF	SODIUM SILICOFLUORIDE
STN	STEAM
STS	STORM SEWER
STW	STORM WATER
SO2	SULFUR DIOXIDE
HS04	SULFURIC ACID
SW	SURFACE WASH
TEAT	TERTIARY TREATMENT
TPRS	THICKENED PRIMARY SLOUGE
THAS	THICKENED WASTE ACTIVATED SLOUGE
THCK	THICKENING
TOA	TREATED WATER
TF	TRICKLING FILTER
UV	ULTRAVIOLET
VAC	VACUUM
WW	WASH WATER
WWW	WASTE ACTIVATED SLOUGE
WW	WASTE WASH WATER
CDW	WATER - CONDENSATE
FW	WATER - COOLING
DW	WATER - DISTILLED WATER
FW	WATER - FIRE
FRW	WATER - IRRIGATION
OZ	WATER - OZONATED
SWT	WATER - SEW
HW	WATER - WATER HEATING
DEW	WATER DEIONIZED
NSW	WATER NON-POTABLE
PEW	WATER PLANT EFFLUENT
PW	WATER POTABLE
RW	WATER RAW
WWT	WET WEATHER TREATMENT
ZOP	ZINC ORTHOPHOSPHATE

PROCESS CODE ABBREVIATIONS	
FLC_X	FLOCCULATION
GOX_X	GASEOUS OXYGEN
GSX_X	GAS LINE
GRS_X	GREASE
GRIT_X	GRIT
HEL_X	HELIUM
HFL_X	HYDRAULIC FLUID
NCL_X	HYDROCHLORIC ACID (FLUORIDE)
NH3_X	ANHYDROUS AMMONIA
NAC_X	HYDROGEN
NAL_X	HYDROGEN PEROXIDE
INC_X	INCINERATION
INFP_X	INFLUENT PUMPING
INT_X	INTAKE
LAG_X	LAGOON STORAGE
LAP_X	LAND APPLICATION
CLM_X	LINE - HYDRATED
CAO_X	LINE - QUICKLINE
LIM_X	LINE STABILIZATION
LOX_X	LIQUID OXYGEN
LPG_X	LP GAS OR PROPANE GAS
MGN_X	MAGNESIUM HYDROXIDE
MEG_X	METHANE GAS
MTH_X	METHANOL
MIX_X	MIXED LIQUOR
NG_X	NATURAL GAS
NIT_X	NITROGEN
NIO_X	NITROUS OXIDE
OCX_X	OODOR CONTROL
FO_X	FOAM
OIL_X	OIL - FUEL
OZ_X	OZONE
ODX_X	OZONE DESTRUCT
PPX_X	PHOSPHATE
PO4_X	PHOSPHORIC ACID
POL_X	POLYMER
PAC_X	POTASSIUM PERMANGANATE
PAR_X	PRE-AERATION
DMX_X	DIGESTER GAS MIXING
DSDX_X	DIGESTER SLOUGE
DGA_X	DIGESTION - AEROBIC
DMA_X	DIGESTION - ANAEROBIC
DIFX_X	DISSOLVED AIR FLATATION
D10X_X	DISSOLVED AIR FLATATION BASIN
DWHX_X	DRAINAGE
EPHX_X	EFFLUENT PUMPING
EXHX_X	ENGINE EXHAUST
EQBX_X	EQUALIZATION BASIN
FECX_X	FERRIC CHLORIDE
FESX_X	FERRIC SULFATE
FMSX_X	FERRUS CHLORIDE
FRSX_X	FERRUS SULFATE
FLT_X	FILTRATION

PROCESS CODE ABBREVIATIONS	
RES_X	RESIDUALS
RAS_X	RETURN ACTIVATED SLOUGE
RCS_X	REVERSE OSMOSIS
RSC_X	SCREENINGS
SSL_X	SECONDARY CLARIFICATION
SSC_X	SECONDARY SCUM
SEP_X	SEPTAGE
SET_X	SETTLED WATER
SEV_X	SEWAGE
NAC_X	SODA ASH
NAL_X	SODIUM ALUMINATE
NAM_X	SODIUM ALUMINATE
NBC_X	SODIUM BICARBONATE
NBS_X	SODIUM BISULFITE
NCL_X	SODIUM CHLORIDE
NCL2_X	SODIUM CHLORITE
NFL_X	SODIUM FLUORIDE
NAH_X	SODIUM HEXAMETAPHOSPHATE
NOH_X	SODIUM HYDROXIDE
NOCL_X	SODIUM HYPOCHLORITE
NSF_X	SODIUM SILICOFLUORIDE
STW_X	STEAM
STS_X	STORM SEWER
STW_X	STORM WATER
SO2_X	SULFUR DIOXIDE
HS04_X	SULFURIC ACID
SW_X	SURFACE WASH
TEAT_X	TERTIARY TREATMENT
TPRS_X	THICKENED PRIMARY SLOUGE
THAS_X	THICKENED WASTE ACTIVATED SLOUGE
THCK_X	THICKENING
TOA_X	TREATED WATER
TF_X	TRICKLING FILTER
UV_X	ULTRAVIOLET
VAC_X	VACUUM
WW_X	WASH WATER
WWW_X	WASTE ACTIVATED SLOUGE
WW	WASTE WASH WATER
CDW_X	WATER - CONDENSATE
FW_X	WATER - COOLING
DW_X	WATER - DISTILLED WATER
FW_X	WATER - FIRE
FRW_X	WATER - IRRIGATION
OZ_X	WATER - OZONATED
SWT_X	WATER - SEW
HW_X	WATER - WATER HEATING
DEW_X	WATER DEIONIZED
NSW_X	WATER NON-POTABLE
PEW_X	WATER PLANT EFFLUENT
PW_X	WATER POTABLE
RW_X	WATER RAW
WWT_X	WET WEATHER TREATMENT
ZOP_X	ZINC ORTHOPHOSPHATE

X = PROCESS CODE SUFFIX USED TO FURTHER SPECIFY A PROCESS STREAM (I.E. CL2_0 FOR CHLORINE OR CL2_S FOR CHLORINE SOLUTION)

FUNCTION CODE ABBREVIATIONS	
ACMB	ACTIVATION CHAMBER
ADJ	ADJUSTABLE FREQUENCY DRIVE
AD	AERATOR, COARSE BUBBLE DIFFUSED
AED	AERATOR, FINE PORE DIFFUSED
AFS	AERATOR, FLOATING SURFACE
AES	AERATOR, SURFACE
APC	AFTERCOOLER
AD	AIR DRYER
AF	AIR FILTER
AR	AIR RECEIVER OR REGULATOR
AS	AIR SEPARATOR
AST	AIR STRIPPER
BFP	BACKFLOW PREVENTER
BSN	BASIN, AERATION
BSNX	BASIN, ANOXID/OXIC
BSN	BASIN, SBR
BSNC	BASIN, CHLORINE CONTACT
BSNO	BASIN, OXIC
RSN	BASIN, RECTANGULAR SEDIMENTATION
BFPS	BELT FILTER PRESS
B	BIN (STORAGE - ALL TYPES)
BA	BIN ACTIVATOR
BLC	BLOWER, CENTRIFUGAL
BL	BLOWER, POSITIVE DISPLACEMENT
BLR	BOLLER
BDZ	BULLDOZER
CCL	CALIBRATION COLUMN
CRG	CENTRIFUGAL
CHF	CHEMICAL FEEDER
CLS	CHLORINE GAS SCRUBBER
CLF	CLASSIFIER, FLOTATION
CLC	CLASSIFIER, SECONDARY
CLD	CLASSIFIER, GRIT
CV	CLEARWELL
OMP	COMPRESSOR
CMR	COMPRESSOR, LIQUID RING
CMR	COMPRESSOR, ROTARY SCREW
CMR	COMPRESSOR, STEAM
CTR	CONTAINER, PROCESS
COB	CONVEYOR, BELT
COB	CONVEYOR, SCREW
CFD	COVER, ALUMINUM DOME BASIN
CFD	COVER, FIXED DIGESTER
CFD	COVER, FLOATING DIGESTER
COB	COVER, GAS HOLDER
CMR	COVER, MEMBRANE
CRN	CRANE
CRG	CRANE, GANTRY
CRJ	CRANE, JIB
CRP	CRANE, PORTABLE GANTRY
CRN	CRANE, TRAVELLING BRIDGE
CYL	CYLINDER, CHLORINE
CYL	CYLINDER, GAS

FUNCTION CODE ABBREVIATIONS	
DWS	DEWATERING SCREW
DPS	DIAPHRAGM SEAL
DF	DIFFUSER, CHANNEL
DFB	DIFFUSER BANK
DIF	DIFFUSER, PIPELINE
DIR	DIFFUSER, TANK
DGE	DIGESTER, AEROBIC
DGP	DIGESTER, ANAEROBIC PRIMARY
DGS	DIGESTER, ANAEROBIC SECONDARY
DSUV	DISSOLUTION UNIT, UV
DSV	DISSOLVED AIR FLATATION THICKENER
DDC	DUST COLLECTOR
EDU	EDUCATOR
ELM	ELECTRICAL EQUIPMENT, GENERAL
EMW	EMERGENCY EYE WASH FOUNTAIN
EMW	EMERGENCY SHOWER
EMW	EMERGENCY SHOWER & EYEWASH
EOP	EQUIPMENT, BUILDING SERVICES
EOP	EQUIPMENT, GENERAL OR UNSPECIFIED
EV	EVAPORATOR
EXC	EXPANSION CHAMBER
FAN	FAN, AXIAL FLOW
FAN	FAN, CENTRIFUGAL
FST	FENCE STRIPPER
FSP	FILTER GAS PARTICULATE
FLC	FILTER, CARTRIDGE TYPE
FLT	FILTER, UNDERGRAINS OR PRESSURE
FSW	FILTER, SURFACE WASH EQUIPMENT
FTNG	FITTING, MISCELLANEOUS
FLR	FLAME ARRESTER
FLO	FLAME CHAIN
FAR	FLOCCULATOR, HORIZONTAL
FVC	FLOCCULATOR, VERTICAL
FD	FLOOR DRAIN
FS	FLOW SPLITTER
FLM	FLOTTING MEDIUM
FMS	FOAM SEPARATOR
FL	FORKLIFT
FE	GAS FEEDER
FL	GAS FLARE
GW	GAS WATER HEATER
FL	GATE, FLAP
GSD	GATE, SLIDE
GSC	GATE, SLUICE
G	GATE, WEIR
GEN	GENERATOR, ENGINE (BACKUP POWER)
GB	GRAVITY BELT THICKENER
GVT	GRAVITY THICKENER
GRD	GRINDER PULVERIZER
GRV	GRIT BASIN, VORTEX TYPE
GRV	GRIT SCREEN CONCENTRATOR
HEX	HEAT EXCHANGER
HST	HOIST

FUNCTION CODE ABBREVIATIONS	
RSV	RESERVOIR
RSC	RESIDUAL COLLECTOR
RM	ROTAMETER
RD	ROT RUPURE DISK
RMP	RUMPLE SAMPLER
SC	SCALE
SC	SCALE, WEIGHT
SCRNT	SCREEN, HORIZONTAL
SCR1	SCREEN, INLINE SLOUGE
SCR2	SCREEN, MANUAL OR MECH CLEANED BAR
SCR3	SCREEN, STEP
SCR	SCREEN, TRAVELLING WATER
SCR	SCREEN, VIBRATORY
SCU	SCUM COLLECTOR
SCW	SCUM WEIR - ROTATING
SEP	SEPARATOR, MOISTURE OR CYCLONE
SGL	SIGHT GLASS - TALL
SG	SIGHT GAUGE
SIT	SILINDER
SLC	SLOUGE COLLECTOR, CIRCULAR
GLN	SLOUGE COLLECTOR, CROSS
SFC	SLOUGE COLLECTOR, FLOC-CLARIFYING
SCS	SLOUGE COLLECTOR, SEC CLARIFIERS
SSC	SLOUGE COLLECTOR, SOLIDS CONTACT
SLCS	SLOUGE COLLECTOR, STRAIGHT LINE
PCN	PARTICLE COUNTER
PLT	PELLETIZER
PS	PENSTOCK
PIPE	PIPE
PLT	PLATE SETTLER
IRJ	POLYMER INJECTOR RING
PRB	PRESSURE BUILDING BOIL
PD	PULSATION DAMPNER
PAD	PUMP, AIR DIAPHRAGM
PKL	PUMP, CENTRIFUGAL
PDM	PUMP, DIAPHRAGM METERING
PHW	PUMP, HEATING WATER
PH	PUMP, HORIZONTAL END SUCTION
PSC	PUMP, HORIZONTAL SPLIT CASE
PPS	PUMP, PERISTALTIC
PLP	PUMP, PLUNGER
PCC	PUMP, PROGRESSING CAVITY
PSE	PUMP, SCREW ENCLOSED
PSE	PUMP, SUBMERSIBLE
PCL	PUMP, SUBMERSIBLE
PCN	PUMP, SUBMERSIBLE CHOPPER
PTB	PUMP, TURBINE
PSP	PUMP, SURFACE
P	PUMP, POSITIVE DISPLACEMENT
P	PUMP, ROTARY, DRUM OR BELL MOUNTED
PVD	PUMP, VERTICAL DIFFUSION VANE
PVE	PUMP, VERTICAL END SUCTION
PVM	PUMP, VERTICAL WET PIT
RVB	VACUUM BREAK
VRD	VACUUM REGULATOR
AVR	VALVE, AIR RELEASE
AVRV	VALVE, AIR-VACUUM
VAD	VALVE, ANGLE
VMB	VALVE, ANVA BALL
VBF	VALVE, ANVA BUTTERFLY
VRP	VALVE, BACKFLOW PREVENTER
VMB	VALVE, BALL MISCELLANEOUS
VCK	VALVE, CHECK
VAD	VALVE, CONE
VGD	VALVE, DIAPHRAGM OPERATED
VDD	VALVE, DOUBLE DISC GATE
SWT	VALVE, ECCENTRIC PLUG
VER	VALVE, EXPLOSION RELIEF
VFW	VALVE, FOUR WAY
VG	VALVE, GATE
V	VALVE, GENERAL OR UNSPECIFIED
VGL	VALVE, GLOBE
VBL	VALVE, INDUSTRIAL BUTTERFLY
VKG	VALVE, KNIFE GATE
WRB	VALVE, MATERIAL HANDLING ROTARY
VMD	VALVE, MUD
VND	VALVE, NEEDLE
PTV	VALVE, PILOT
VPN	VALVE, PINCH
VPD	VALVE, PISTON OPERATED
VPL	VALVE, NON-ECCENTRIC PLUG
VPC	VALVE, PRESSURE REDUCING
VPC	VALVE, PRESSURE SUSTAINING
VPR	VALVE, PRESSURE RELIEF
VSPV	VALVE, PRESSURE/VACUUM RELIEF
VP	VALVE, RESILIENT SEATED GATE
VGR	VALVE, RESILIENT SEATED GATE
VSR	VALVE, SAFETY
VSLV	VALVE, SLEEVE
VSL	VALVE, SOLENOID
VTV	VALVE, TELESCOPING
VTS	VALVE, THERMAL SHUTOFF
VTB	VALVE, THREE WAY
VVP	VALVE, V-PORT BALL
VAP	VAPORIZER
VSB	VESSEL, BOOT
WC	WEIR, CIPOLETTI
WR	WEIR, RECTANGULAR
WRV	WEIR, V-NOTCH
WLC	WELL, HORIZONTAL COLLECTOR
WLH	WELL, VERTICAL

DATE: 11/20/2021

REVISIONS AND RECORD OF USE: NO. BY DATE

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Certificate No. 8132

PROJECT NO. 199322

SHEET 24 OF 27

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